

Specifically, the invention envisages a software application for end users that allows a user to create two different types of software agents, namely a seller agent and a buyer agent. A seller agent creates an auction on a selling user's computing device, given certain parameters such as reserve price, date of auction and description of product. A buyer agent,  
 5 on the other hand, searches other participating systems over a communications network for an auction that fits a buyer's criteria, and either (a) makes bids on the buyer's behalf or (b) connects the buyer to the seller in order that the buyer may bid 'live' for the item on sale.

The invention therefore extends to an agent adapted to generate, when resident on a user terminal, an offer to buy or to sell an item for matching with an offer from another user  
 10 terminal, the agent including means responsive to a match between offers to open a peer to peer communication channel between the host user terminal and another user terminal generating a matching offer, and means for running an auction via the communication channel. Similarly, the invention encompasses a user terminal having a software agent resident thereon being adapted to generate an offer to buy or to sell an item, to open a peer to  
 15 peer communication channel with another user terminal in response to a match between offers and to run an auction on the host terminal.

In this specification, an 'agent' is taken to mean a software application that acts on a user's behalf to convey offer criteria to a server and/or to other user terminals and to respond to the user with news of an auction's progress. The agent of the invention is not necessarily  
 20 intelligent: if needs be, it can simply follow the user's instructions to act as an interface between the user and an online auction system, and to represent the user in that system.

The invention allows direct communication between bidders and sellers thus alerting those users to changes in an auction as soon as they happen. This direct link also means that it is possible to perform 'live' online auctions as well as the automatic auctions that occur on  
 25 existing auction sites.

It is preferred for the application of the invention to be installed upon the 'desktop' of the user's computing device to run constantly as a background task. Other desktop tools such as the live chat tool AOL Instant Messenger (trade mark) have demonstrated the power of having an application constantly running in the background of the computer and its appeal to

users over accessing a simple website for 'live' services. This appeal extends to the service providers that provide the services accessed via background desktop applications, who benefit from the user's perceived commitment to those services in terms of advertising effectiveness, community-building and so on.

5       The agent system of the invention also offers an enhanced searching ability that utilizes co-occurrence and context vector pattern matching technologies that enable matching to be based on a broad semantic understanding and fuzzy logic; other auction and trading systems rely on simple keyword pattern matching for searching through items on offer.

## 10       **Brief Description of the Drawings**

In order that this invention can be more readily understood, reference will now be made, by way of example, to the accompanying drawings in which:

Figure 1 is a block diagram showing, in outline, a first embodiment of the invention that involves a combination of peer-to-peer and client-server architectures;

15       Figure 2 is a screen shot of a user interface of a client application in the first embodiment of the invention;

Figure 3 is a block diagram showing a log-in procedure for a user of the system outlined in Figure 1;

20       Figure 4 is a screen shot of a user interface of a seller agent created by the client application of Figure 2;

Figure 5 is a screen shot of a user interface of a buyer agent created by the client application of Figure 2;

Figure 6 is a screen shot of a user interface presented by the client application when a match is perceived between offers;

25       Figure 7 is a block diagram corresponding to Figure 1 but showing a multiple-buyer, single-seller scenario in which a seller user's computer acts as a server to the buyer users' computers; and

Figure 8 is a block diagram showing, in outline, a second embodiment of the invention that involves peer-to-peer architecture and has no need of a server.

### **Detailed Description**

Referring to the first embodiment of the invention as shown in Figure 1, respective users at two clients, Client A and Client B, can access a server 10 via the Internet or other communications network. The architecture of this embodiment therefore has client-server characteristics. There would of course be many more clients in practice, but just two clients are necessary to illustrate the broad inventive concept.

The terminals of Client A and Client B have been enhanced in accordance with the invention, preferably by executing a suitable installation program on the respective client terminals. If desired, that program can be downloaded from a server 10. Specifically, each user has a client application that runs on their terminal in the background and that enables the user to create buyer and/or seller agents dedicated to the task of buying or selling such items as the user may specify, or of locating buyers and sellers for such items. The creation and use of these agents will be described in detail below with reference to Figures 2 to 7.

Once a buyer or seller agent has been created by a user with a view to buying or selling a particular item, the pertinent criteria of a corresponding offer to sell or to buy that item are uploaded to a central database associated with the server 10 (steps 1 and 2 in Figure 1) that looks for matches (step 3). Offers to sell or to buy will be referred to collectively hereinafter as 'offers' as distinct from 'bids' for a particular item in an auction that is initiated by matching an offer to sell with an offer to buy, making a matching pair. Unlike HTTP (hypertext transfer protocol) requests which simply attempt to 'get' a user-specified file via a server and return a 'file not found' result if the file is not promptly found, the offers are phrased in a non-HTTP protocol whose data packet structure will be described in detail below. This protocol is such that several criteria of an offer can be transmitted to the server 10 and then reside on the server 10 in a persistent manner so that even if a match between an offer to buy and an offer to sell is not found immediately, the first offer of a matching pair can be retained by the server 10 until it is matched with the second offer of the pair when the second offer is received and processed by the server 10. The criteria of the offers can include, for example, the price, condition and description of the item. Offer criteria can be associated with a file relating to the item, such as a JPEG picture of goods for sale.